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# Science and Citizenship

A Lecture delivered before the  
Manchester Sociological Society  
November 13th, 1905

BY

V. V. BRANFORD, M.A.

London  
George Allen, 156, Charing Cross Road  
1906

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Bradenley from V. V. Branford

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## SCIENCE AND CITIZENSHIP

### I

AN eminent sociologist has recently spoken of the "bankruptcy of science as to any choice of ideals of life," and again we are told that "sociology no more than mechanics or chemistry has any policy." That doubtless is the prevalent view in these reactionary times, when apostasy from science is almost a fashion. The object of this paper is to maintain the contrary view. And although the logic of its argument may be open to revision, the moral principle from which it starts will not be gainsaid. That principle is embodied in the well-established maxim, "If a lion gets in your path, kick it." There are those who believe that the way out of the present tangle of sectionalisms is to be found, not by turning back, but by pressing on. If science cannot direct us, we must direct science. All life is growth, and science understood as a spiritual phase of racial life, a mood of humanity, may, like other spiritual growths, be trained and guided, within limits. Here as elsewhere the essential condition of guidance is the presence of an ideal and a moral impulse toward it. It is the contention of this



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paper that the ideals of science, always implicit, are now actually in process of being explicitly formulated, and that these ideals give promise of a policy of city development. And once to see and feel this movement of science is to participate in it, to forward and direct it.

### II

In a first rough approximation it may be taken that the middle term between Science and Policy is Potency. The conception of Potency presents itself to us with a reality and a force proportional to the frequency and intensity of our first-hand immediate and direct contacts with nature. The conception doubtless reaches a vanishing point in the minds of that urban breed of domesticated animals which are cut off from nature by continuous confinement in the cages called town houses; this variety of animal degenerates into a sort of subnatural species, with supernatural cravings. The city in its evolution is of course a natural phenomenon; but within the city, the barriers between man and nature are numerous and formidable. Amongst the dwellers in cities, it is probable that the only persons who are in habitual contact with nature are mothers and poets. To the mother the infant is an embodiment and epitome of all the potencies of nature. The baby, as has been well said, is a bundle of potencies. Its development through adolescence to maturity is the realisation of its potency for evolution or

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for degeneration. The process of growth is, in the proper sense of the word, the education of the child, that is to say, the drawing out of its potencies. In its training and education the primary factors are three. These are the hereditary predispositions of the child, the resources available for its education, and finally, the ideals of the mother. It is the last which is perhaps the most important for the progress of culture, for of the three factors the ideal of the mother is the most variable, the most modifiable, and therefore the most subject to control and guidance. The mother's ideal is a compound of the types of humanity that have most appealed to her in actual life, in romance, and in history. In other words, it is, whether she knows it or not, the historical or racial imagination of the mother that determines her ideals. She directs the education of her child towards her personal ideals of strength, of health, and of wealth, towards her personal ideals of beauty in person, of wisdom in thought, of goodness in deed. And in proportion as these different aspects of the mother's ideal of manhood and womanhood harmonise into an imaginative unity, a synthetic reality, in that proportion she has an educational policy for her child. For a policy is but a name for a system of dealing with one's resources for a definite purpose. In short, a policy is a scheme for the development of potencies in the direction of an ideal realisation.

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## III

What is the relevance of all this for science? There are two dominant moods or manifestations of science: the cosmic, the naturalistic or geographical mood, on the one hand; and on the other, the humanist, the historical, the idealist mood. In the former, the cosmic mood, the scientist feels a relatively slight interest in the human race and its doings. There are so many more impressive phenomena in the field of observation! Are there not one hundred thousand species of beetles compared with a single species of man? The entomologist bulks larger in science than the sociologist, simply because the boy is father to the man. The scientist in his cosmic mood is a stereotyped, a perpetual boy. The curiosity of the boy about the wonders of nature ceases, from the moment when his collection of curiosities fills the last of his pockets. But the pockets of the scientist take the form of extensible museums; and hence the temptation to go on collecting, until the habit determines his life, and in course of time he finds himself unable to feel either the cosmic or the human emotion.

As the boy sometimes grows into the man, the cosmic scientist may grow into the humanist one. He no longer observes the phenomena of nature as a mere series of sequences and co-existences following each other in endless succession; he looks upon nature as a reservoir of resources for the use of man. He seeks out the potencies of

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nature, foresees their possible developments, and conceives his ideals of human life in terms of the optimum expression of known potencies. In Bacon's phrase, man controls nature by obeying her. In this respect science is just the ordered and growing knowledge of the ways of nature leading to human evolution. Science, in its pure and applied forms, here stands for the collective resources of the race available for the maintenance and advancement of human life. Science is thus—in terms of the illustration used above—a sort of generalised mother of men, as it were, a race-mother. And if the policy and ideals of science for her children are slow of formulation, that is because of the slow evolution of science itself. Arrested at the cosmic stage of thought, the majority of scientists do not recapitulate, with sufficient completeness, the racial evolution of the group to which they belong. Such racial recapitulation is, as has been well said, nature's way of preparing for a fresh start. And unless, therefore, the individual scientist in his own personal development passes on from the cosmic, physical or naturalist phase to the humanist and idealist phase, he does not undergo the preparation necessary to enable him to contribute to the advancement of science in its proper historical evolution. In this arrested development of most individual scientists is doubtless to be found an explanation of the slow evolution of the humanist or sociologist sciences.

If we understand by spiritual power a set of

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established beliefs, like Judaism, Mohammedanism, Romanism, that influence conduct and determine the mode of life, then we must say of science that it is an incipient rather than an actual spiritual power. In this sense there are sciences but no science. If we look round us amongst our contemporaries, we should most of us have to search far before finding an individual whose life and conduct are unified by science. Notable examples are, to be sure, numerous in history—such as Lavoisier and Condorcet, Helmholtz and Pasteur, Darwin and Clifford, and, if it is permissible to cite living scientists, Berthelot and Haeckel, Francis Galton and Karl Pearson. Similar though less notable contemporary instances are not common, though in all probability they are more numerous in the obscure annals of University and Academy, Museum and Library, than most of us imagine. There are many whose lives are unified by religion, still more by marriage, and not a few by Monte Carlo. But the truth is that as yet science has afforded no rounded doctrine of Humanity sufficiently simple and facile for the comprehension of the artisan, the rustic, and the cabinet minister. The difficulty of that achievement lies mainly in the natural history fact, that the scientific habit of mind in the observation of social phenomena, though it is universal amongst children, yet persists in few adults. It survives adolescence in a certain number of social investigators, like anthropologists, folklorists, economists, historians, psychologists, &c., most of whom are so highly specialised as to have

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lost the instinctive desire for a general doctrine of social evolution. It survives also in a limited number of sociologists, many of whom are reluctant to be labelled with that title. Thus the dispersion and isolation of the sociologists, and the ignorance and unpopularity of the name, are due not so much to the hardness of the word, or the difficulty of the doctrine, as to the prevailing inability of the folk-mind to distinguish between sociology and socialism, between science and scepticism.

### IV

Thus, owing mainly to the incompleteness and sterility of the social sciences, the unification of science is very far from being a visible reality, and consequently the influence of the scientific party is relatively slight in every country of the occidental world, and least important of all perhaps in Great Britain, with the possible exception of Spain and Venezuela. It is but the other day that the only high-level meteorological observatory of Great Britain was closed, and the staff dispersed, the records ignored even without examination, and the apparatus offered for public sale—all because the influence of the scientific party was not equal to securing for its support about £500 out of the one hundred and forty odd millions which constitute the annual national budget. In laudable over-estimate of the desire of other European Governments to possess meteorologists, the Government of the Argentine Republic cabled to secure the staff of the Ben

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Nevis Observatory ; and as they were in this largely successful, it may be that what has been lost to the British Empire by this calamitous misadventure is to be preserved for science. A measure of the relative weight exercised in the councils of the nation by the scientific and militarist parties is seen in the annual grant made by the Central Government to the collective university chests of Great Britain and Ireland. This grant is about £100,000 per annum. That is about the sum expended in keeping in commission for a year a single first-class battleship. And if we add to this an allowance for depreciation and certain necessary incidental expenses, the annual cost of a first-class battleship would probably reach to three times the university grant, for a first-class battleship costs about a million sterling to build, and is not effective for much more than a decade ; and the addition of each one to the fleet necessitates for its full efficiency an increase of dockyard and harbour accommodation, the cost of which, if it were known, would probably be found to run into hundreds of thousands of pounds. A final illustration. An eminent astronomer who had spent a long life alternately in the observatory and as professor in the university class-rooms, recently retired. That his salary had been little more than the earnings of a successful artisan need be no ground of reproach to the good scientist ; but the rigid application of official regulations, framed for a somewhat dissimilar purpose, resulted in the allocation of a pension which was entirely insufficient to

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provide for the few and simple wants of the aged astronomer in his retirement. Representations were made to the Central Government, and a complacent officialdom awarded an increase of the pension at the amount and rate of 2s. 6d. per week.

If we assume that at present there is no science, but sciences—unclassified and therefore ungeneralised, it would seem to follow that there is no scientific ideal, but only scientific ideals—unharmonised ; and no scientific policy, but only scientific policies—un-co-ordinated. The scientific party, or what would be the scientific party if there was a common doctrine to give it cohesion, is broken up into disparate groups, most of which do not speak each other's language. For instance, the mathematician and the physiologist are separated from each other by a wide arc in the circle of the sciences ; but they have this in common, that each holds it an article of faith that he would fall short of his scientific duty if he did not acquire the language of France, Germany, and Italy, as well as of England. But if it should happen that here and there a mathematician or physiologist takes the pains of learning the language of comparative ethics, folklore, economics, or any other sociological field, he will be held by his brother mathematicians and physiologists to be doing what is at best a work of supererogation, at worst an act of reprehensible wastefulness. To the scientist of the physical or biological group it appears as much and as little a matter of professional obligation to acquire the language of the sociological group as to acquire



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that of the Hottentots. What then amid this apparent confusion and disruptiveness of science is the inquiring citizen to do if he wishes to know the bearing of science on citizenship? The answer of science, as of every other spiritual power, is that there is only one way to know the doctrine, and that is to lead the life.

### V

The scientific quality of citizenship can only be apprehended through the scientific conception of the city. And the first question which science asks about the city is—What is it?

What is a City? Legal and political definitions we have, but seemingly no scientific ones as yet. Now legal and political definitions, whether of cities or other social phenomena, are, as it were, ready-made articles of common usage, alike popular and recondite. To the majority of scientists—that is to say, those arrested at the mechanical stage of scientific thought—such definitions are alternately meaningless mysteries to be scoffed at, or shibboleths naively adopted by these scientists themselves, whenever social action is unavoidable or social thought demanded. On the other hand, there is a small but ever-increasing number of scientists, who push on through the world of form with which the mathematical sciences deal, onwards through the world of matter with which the physical sciences deal, and thence through the world of organic life with which the biological

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sciences deal, and finally attempt to explore in a scientific spirit and with scientific methods the world of mind and society with which the psychological and social sciences deal. And this, as already stated, is the normal progress of the mind. We see it exemplified by most of the great leaders. We see it, for instance, in Helmholtz, who began his career as a mathematician, passed through that to physiology, whence it was but a single step into psychology, and in the later period of his life he interested himself most in education and social questions. The same tendency is seen in Darwin's transition from the "Origin of Species" to the "Descent of Man." We have been told that the sociologist is an individual who has failed to make a career in one of the preliminary sciences, just as, according to Disraeli, the critic is a person who has failed in literature. In point of fact this doubtless is often true; but the contrary proposition still more widely holds, that the successful mathematician, physicist, or naturalist, is an arrested sociologist.

Returning to the question of legal and political definitions, we have to note that these, are to the psychologist and sociologist an essential part of the raw material upon which he has to work. They are points of departure in his observations, and often supply valuable clues in his researches. What definitions of the City are available for the purpose? They differ, of course, from country to country, but whether propounded by a lawyer, by a politician, or by the man in the street, they

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belong, in the eyes of the comparative psychologist, to the folklore of the country. In short, they are pre-scientific. In England, the legal definition of a City is, as every one knows, a place which is or has been the seat of a bishopric. In other words, a City is essentially a cathedral city. To this we must return later, merely noting it now as for the sociologist a great "pointer fact," in the phrase of Tylor. In the United States of America, the conception of a City is, in appearance at least, of a more material kind. In that country there is no lack of resources of observation, for it is a place where a crop of new cities is grown annually. The process of city making may be seen as a matter of almost daily observation in new and rapidly developing states of the Union, like Oklahoma and Alaska.

### VI

There is perhaps no more representative type of American civilisation, and also, therefore, of the dominant phase of the contemporary western world, than the American railway engineer. He is the true Viking of the times, and is already on the way to plant his forges, and open his lines of communication all round the margin of the Pacific Ocean. What is the conception of a city in the mind of the American engineer? Direct items of evidence may be gathered from almost any of the innumerable reports on new railway enterprises, which are common documents, not

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only in the great cities of America, but also in the capitals of Western Europe. The following extract is taken from a typical document of this sort. An eminent engineer is reporting on a proposed railway from Oklahoma into Indian territory. He surveys and records centres of population, actual, incipient, or prospective, along the route of the projected line, taking one centre after another in the following fashion :—

“CHICKASA is the recording-town of the Nineteenth District. Population claimed, 8000. The town site has an area of 124,619 acres, and is located in the valley of the Washita river, surrounded by rich farming lands, where corn, wheat, oats, rye, potatoes, and all kinds of vegetables, fruit, and berries grow in abundance. Horses, mules, and cattle are raised.

“It is an incorporated city with a city government, and is the recognised jobbing centre of the south-western section. Contains among other the following industries :—

Chickasa Cotton Oil Co., capacity 120 tons per day.

Chickasa Milling Co., capacity 800 barrels of flour per day ; two elevators, capacity 100,000 bushels.

Chickasa Iron Works.

Choctaw Mill and Elevator Co.

Traders Compress Co. (about 30,000 bales).

Electric planing mill.

Steam brick plant.

Wholesale grocery, hardware, furniture, saddlery and harness stores, and general merchandising.

“The city is provided with electric light plant, ice plant, two telephone exchanges, water-works and sewerage, gas plant (under construction).”

It will be noticed that this engineering conception of a city does not envisage a single culture

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institute—not even a church or public-house. This, however, is an omission rectified in a document issued by the Seward Chamber of Commerce in August 1905, descriptive of the growing towns and cities of Alaska. Of Seward itself the document says: “Although but one year old, it contains general stores of every kind, hotels, ten saloons, a bank capitalised at 50,000 dols., a daily newspaper, four churches, a flourishing public school, an electric light plant, and a telephone exchange.” Of a place called Fairbanks we are told that: “The city had a population of 7500 on 1st July 1905, and was equipped with every modern convenience, such as telephone, electric light, water-works, churches, public schools, and a daily paper receiving a full telegraphic report of the world’s news.” It is clear that what the American railway reformer understands by a city is not a city at all, but a Town—*i.e.* in the admirably correct and concrete phraseology cited, it is a “jobbing centre.” To the list of the urban “conveniences,” the Chamber of Commerce standard adds, churches, schools, newspapers, and saloons. And the progress in civic ideals is signal. For churches, schools, newspapers and saloons are institutes of culture; and are seen to be the lower institutes of culture only when contrasted with Cathedral and University, with Scientific Society and Art Museum as higher ones.

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## VII

A visitor to any of the goods stations of the railways running into London from the north, will see any day of the year, but more particularly in the autumn, vast numbers of coal-laden trucks awaiting delivery. It may be said of at least two of the northern railway systems, that they exist for the purpose of carrying coal to London. The traveller who is carried, in about two hours, from St. Pancras to Nottingham in a luxurious restaurant car may imagine that the Midland Railway is designed and administered for his benefit and comfort. But that is an illusion of the unreflecting citizen. The truth is, that the luxurious restaurant car is itself a bye-product of the coal traffic. In the eyes of the representative railway engineer the cities of England are, primarily just the terminal yards of the collieries; and the citizens themselves, according to his ethical scheme, rank in status and civic worth in proportion to the capacity of their respective factory furnaces. With literal and historical accuracy, the typical railway engineer sees the modern locomotive as just an elaborated pit pump-engine placed on wheels, and engaged all day in hauling coal-laden trollies from the pit mouth to the cities, and all night in hauling them back empty. To the railway engineer, science is a means of transmuting the energy of coal into cities and citizens. It follows that his policy of city development—or, as one should rather say, urban expansion—leans to the erection and multiplication of lofty

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chimney stacks. The ideal citizens, pictured in the carbonaceous logic of his occupation, are stokers and chimney-sweeps. It requires little observation and less historic insight to verify the affirmation, that urban expansion in the nineteenth century was largely determined by the unavowed but real ideals of a coal civilisation.

The archæologists who are so industriously deciphering the buried histories of cities, have found the accumulated survivals of seventeen different cities in Rome. And so for other historic cities, the successive phases of city formations are marked by layers of superimposed débris like geological strata, with which indeed they are in direct continuity. Each successive civic formation is characterised by the impressions and the marks of its contemporary inhabitants, which survive in material structures like so many sociological fossils. Looked at from this point of view, the coal-laden trucks and the factory chimney stack with all their associated structures, economic and æsthetic, are actual or incipient sociological fossils of the coal cities of the nineteenth century.

To the dwellers in these coal towns—for cities in the proper sense they most of them are not—science presents itself as a kind of inverted philosopher's stone. The accumulated applications of science in the coal civilisations did not end with the production of gold, but rather began with it, more particularly that in Australia and California about mid-century. Given a possession or control of sufficient quantity of the precious metal, the

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citizen found himself able to initiate a cycle of transmutations, and to carry it on up to a certain point, after which it appeared that the cycle completed itself automatically. This sort of scientific magic transformed coal into power to make cheap goods for the consumption of cheap labourers, and the cheap labour then applied itself to coal to produce more power to make more cheap goods for the consumption of still cheaper labourers, and so on indefinitely. This ever-extending series of transformations evidently reaches its culmination in the growth of an ideal city like East London, which so magnificently surpasses all other cities in its accumulated reservoir of cheap labour. Such are the ideals of civic policy which tend to work themselves out in fact and history, if not in word and theory, when city development gets arrested at the stage of Town.

## VIII

Unfair as it would be to English, not less would it be to American civilisation as a whole, to impute to it the conception of civic status restricted to the limitations of the railway engineer or even of the Chamber of Commerce. The United States is not only the country of railway cities and railway kings, it is also the country par excellence, of schools, universities, and educationists. The American "School-ma'r'm" balances the American Viking, and the world trembles in the hope and expectation that some day she may succeed in



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taming and domesticating him. In no other way, probably, can his disforestings and devastations be effectually stopped, and his destructive energies converted to more constructive ideals.

If we define a university as a degree-granting institution, then there are over 700 universities in the United States of America. It is the aspiration of every American city to possess its own university. The university is, in a sense, the cathedral—a somewhat truncated one doubtless—of the American city, and every citizen is unhappy until his city gets what he conceives to be its full complement of culture, in the possession of a university. Here as elsewhere the principle holds—*cujus regio, ejus religio*—and we may agree with Herder's saying, "that the school is the workshop of the spirit of God," provided we are allowed the proviso of defining the divine artificer as the God of that region. Minerva is building again her temples over the land, and nowhere more assiduously than in the United States.

These 700 to 800 American universities are, it is true, reduced to more modest dimensions in the impartial list of the Minerva Jahrbuch. The German compilers of this annual census of the academic world admit only 70 universities in the United States. This number compares with a list of 21 universities in Germany, 16 in France, 18 in Great Britain, 78 in the rest of Europe, and for the whole world 236.

How far may we accept a certain vague popular sentiment which attributes city rank to a town that

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possesses a university? That, to be sure, would be a criterion of civic status unrecognised by, and unknown to, the lawyer and the politician. But universities are not institutions that appeal to juristic and political minds. In Russia, the state corrects academic exuberance by occasional application of the military musket and the police baton; in India by proscribing progressive literature; in England by the more subtle processes of financial starvation. There is in the normal undergraduate mind a youthful ardour that is highly resistant to the juristic ideals which lawyers and politicians call stability, and physiologists call ossification. Is, then, this popular conception of the vital civic importance of the university a useful starting-point for the sociological investigator? In any case, it is a well-recognised truth that popular conceptions are, for science, more convenient points of departure than culture ones, since they are nearer to that naked and unadorned order of nature, to which the scientist must constantly return for the verification of his thought.

### IX

Assuming, then, as a provisional criterion, the possession of a university as a determinant of civic status, we have in the university cities of the world two hundred and thirty-six objects which actually exist in time and space. Here is an abundance of concrete objects for observation, without which the scientific investigator, whether of cities or other phenomena, cannot get to work at all. His methods,

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as he is apt somewhat wearisomely to remind us, are those of observation and classification, by comparison, generalisation, prediction, and verification by return to the concrete. To put it most briefly, the method of science differs from the method of other orders of thought in the necessity for arranging the various stages of investigation in such a way that two possibilities are always open. In the first place, it must be possible for every member of the scientific fraternity, present and future, to retrace and repeat every vital step in any and every investigation, from simple concrete observation right up to the largest generalisation. In the second place, it must be possible to return from the largest generalisation or the loftiest aspiration back to the concrete facts of nature, by a continuous series of steps, by an unbroken chain of evidence. This is the sacred Way of science. In most, if not all, the great religions of the East a peculiar sanctity attaches to the conception of the "way." That a mystic flavour should cling to Methodology will not therefore be surprising to those who hold that science is a culture-form of natural religion.

### X

Having provisionally agreed upon our scientific criterion, we have two hundred and thirty-six definitive objects that exist in space and time under the designation of "City." From this proposition it follows that adequate precautions being taken cities can be seen. It is true that to see even a single

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city is a feat which few of us ever achieve. Few of us ever succeed in seeing even our own city, let alone others. Hence the widespread illusion that cities consist of shops, factories and dwellings, with public-houses at the corners—these being the objects presented to the eye, as one passes along the open tunnels called streets. But there are certain animals, like birds, butterflies, and some human beings, that have the habit of viewing terrestrial objects from a height. And it is obvious that it is in vertical perspective only that a city can be visualised. The habit of viewing objects, both terrestrial and celestial, from a height was apparently a much commoner habit among the human species in former than in present times. Otherwise, how explain the wide occurrence of special facilities for the purpose? The mounds, the pyramids, the towers of many kinds which past civilisations have erected in such abundance, have doubtless various origins. But when facilities occur, as they generally do, for reaching the summits and thence making observations, we are bound to infer that we are dealing with real observatories deliberately planned for that purpose, whatever other purposes, religious, ceremonial, commemorative, æsthetic, these constructions may also have served. Our recent and contemporary civilisations continue to adorn or supplement our buildings with towers as inevitable, and, one is inclined to say, as automatically as the beavers build their dams and the bees their hives. But more often than not, we do not provide a stairway to the summit; or if we add that, how seldom

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are facilities provided for observation from the summit. Even to the old church and castle towers that survive with their stairway and their observing platform, access is generally made difficult or impossible to obtain. We lock them up, and if that does not guard them against the curiosity of the citizen and tourist, there are other well-known modes of generating indifference. There is the custom of charging an entrance fee, which represents a considerable slice out of the worker's day. And if all these precautions fail, there is the final and frequent resource of losing the key. Assuredly the gods first blind those whom they wish to destroy.

The Imperial Institute in London, which commemorates the Jubilee of Queen Victoria, is adorned with a handsome and commodious tower of many storeys. In each storey there is a large chamber. A visitor in the early days of the Institute asked permission to enter and ascend the tower. The officer in charge was complaisant, and offered to conduct the visitor over the tower; but the key could not be found, and the visitor said he ~~would~~ return another day. On his next visit he was told that the key had been found, but it was not considered advisable to use it, for the structure of the tower was defective! Is any further explanation needed of the admitted failure of the Institute in the first decade of its existence? Happily, it has now been reorganised, and entered on a more useful phase.

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## XI

In order to see our cities as they really are, we must first of all see them in geographical perspective ; and in order to do this we must recover the use of existing towers. We must also begin building new ones, designed and equipped to aid us in seeing with the eye of the geographer. In the scientific vision the first element is the vision of the geographer ; or, putting it in another way, in the complex chord which we call science the first note is a geographical one. This vision of the geographer, what is it ? Whence comes it ? How may we ordinary citizens acquire it ? What use would it be to us if we did acquire it ?

Our school initiation into geography acquaints us with a certain scheme of form and colour symbolism which we call a map. The impression which intimate familiarity with the maps of our childhood leaves on the mind is apt to be a picture of the country called France, which is little more than an octagonal red patch, of Spain a square brown patch, of Scandinavia an oblong green patch, of the Rhine a blue line running from a dark patch called Switzerland, to a blue patch called the German Ocean. The experience of reading, observation, and travel doubtless supplements and corrects these crude pictorial impressions ; and, in proportion to the fulness of such later experience, we approximate more nearly to the vision of the geographer, who sees our globe as it really is, has been, and is becoming, in space

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and time. The geographer sees the land in its varying relief from sea-shore, over plain and plateau, valley and height, up to mountain summit. He sees below the surface of the waters, noting the shape and level of river-bed, of lake and sea bottom. He sees the crust of the earth everywhere in section, from the lowest and oldest rocks up through the superimposed geological strata, to the superficial deposits which wind and rain, storm and sunshine, snow and frost, disintegrate for the making of soil, on which the flora of the world fix themselves and feed, region by region, and across which the fauna of the world move and make their tiny marks and scratches. He sees the surface of the globe changing from day to day, season to season, age to age, epoch to epoch. And these changes he sees to be brought about in part by the place of the globe in space, and its relation to other celestial bodies, and in part by the very shape, form, and character of the surface and configurations themselves. Thus to the geographer the phantasmagoria of visible things presents itself as a drama, a great cosmic drama in which the part allotted to the human species is both insignificant and predetermined in all essential respects. The operations of man on the planet are, from this point of view, limited and conditioned by inexorable cosmic forces. The roads and railways, by which man connects his cities, are seen to be the merest scratches on the surface of the globe, wholly comparable in their insignificance to the tracks which the elephants

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make through the forest, or the buffalo across the prairie. The cities themselves are but temporary encampments of herding groups of animals, determined or conditioned by such natural features as a river or a plain, an estuary or a mountain, a coal-bed or a forest. How relatively slight a geographical disturbance is made by the building of a city—even a modern capital city—may be realised by recalling, that practically the whole of the new town of Edinburgh is built out of a local sandstone quarry, so small that its floor would not afford camping space to a travelling circus.

### XII

The foregoing account is intended to suggest the geographer's vision as it is in his naturalist or cosmic mood. But the geographer is himself a man and a citizen, and as geographer he still has his humanist or idealist mood. Viewed in his humanist or idealist mood, the world drama undergoes for the geographer a profound change. The perspective changes from the cosmic to the human focus. The typical river valley, which is the essential regional unit of the geographer, is no longer a mere fold of the earth's crust in its endless and aimless cycle of changes, but is conceived as the realisation of a great purpose. The long geological history of the river valley is seen as the preliminary preparation to fit it to be the scene of the exploits and aspirations of a godlike race of beings, such as is suggested and foreshadowed



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by the noblest type of the human species. The designing and the making of a suitable theatre on which the human play may develop is a thought which gives a new orientation to the geographical conception of the river valley. Now the soil and the vegetation which cover its floor, the beds of coal, iron, sand, and limestone which underlie its surface, the forests which clothe its slopes and shelter its animal world, the metalliferous deposits of its mountain sides, the river which from source to sea invites to locomotion, all these are seen to be but energies and instruments awaiting for their orchestration the tuning hand and the idealising mind of man. And the city—the city which embanks and strides the river, which stretches across the plain and juts into the ocean, which ascends the hill slopes or penetrates the mountains—what is the part and place of this city in the vision of the humanist geographer?

When we think of the river valley as the regional unit of geographical science, we have to remember that it is like the ovum of biology—a developing unit containing the potency of a great realisation. What to the geographer in his humanist mood is the city but the effort of this regional unit to realise its own potency for evolution. City development is thus for the geographer no isolated phenomenon, but a normal stage—the culminating one—in a long sequence of events and processes. It is the ceaselessly renewed attempt to make for each region, here and now, its own Eden—its own Utopia.

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## XIII

It may be taken as a postulate of social geography that every region contains the potency of a city or cities, which shall be for that region, here and now, its heaven or its hell. And in the complexity of causes that lead to evolution towards the ideal city or towards its negation, there is a geographical factor awaiting discernment, analysis, comparison with the other factors, and re-synthesis into a synthetic conception. The traditional Civitas, the Urbs Solis, and other similar Utopist visions, have thus their necessary geographical aspect, unless they are to be completely divorced from reality. To the traveller (who is, of course, an incipient geographer) one aspect at least of the geographical factor is necessarily known. The hard experience of the desert is, to the traveller, a geographical prerequisite of the good time that awaits him in Damascus ; and, if dispensing with the geographical prerequisite, he attempts to make his Damascus a perpetual Elysium, what happens ? He is not long in discovering the reality of the phenomenon known in archaic phrase as the Fall, and he quickly discovers a vital connection between geography and theology. Geography, indeed, like every other science, has its element to contribute to the reinterpretation and revitalising of religious phenomena. If it may be allowed to a modest geographer to revise the judgment of so great a theologian as St. Augustine, it would be to point out the tenuity of his geographical

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experience. Had St. Augustine been more of a traveller, he would doubtless have avoided the geographico-historical blunder of believing that it is predetermined once for all which are the cities of God and which are the cities of Satan. One of the truths revealed to us by social geography is that every city is engaged from moment to moment, from day to day, in determining for itself how far and to what extent, here and now, it is, and will become, a city of God, and how far it is, here and now, and will become, a city of Satan. In other words, predestination is a recurring and not a stationary phenomenon.

### XIV

It may be objected by some traitorous professors of the science that the humanist note has extremely little part and place in geography, and the idealist one none at all. But it is always open to us to choose our standards of geography from the great founders of the science rather than from the bookworms parasitic on Petermann's *Mitteilungen*. And in any case, to the determinist geographer, whose scepticism refuses to see the idealist side of the shield, we may reply in the words of Turner to the critic who protested that he could see nothing in Nature like one of the artist's pictures, "Don't you wish you could?" The father of history, Herodotus himself, in passing to humanist studies by way of geography, made a step which, in the normal growth of the geographical

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mind, does not stop short of the loftiest social and civic idealism. This tendency is abundantly illustrated in the lives of the great founders of modern geography. It is seen in Alexander von Humboldt, who continued and completed his geographical career as counsellor of state and co-adjutor with his more humanist brother, Wilhelm, in the organisation of educational institutions. It is seen in Karl Ritter, who, as he progressed in the writing of his great work, was driven more and more to an emphasis of the historical factor. But it is seen most of all in the life and work of Elisée Reclus, whose recent loss we deplore, and whose place in the history of the science it is too soon to estimate, but there are those who believe it will be a culminating one. The eighteen massive volumes of his *Géographie Universelle* were but the preliminary training and preparation for his *magnum opus*, his "Social Geography," happily completed before his death, though as yet unpublished. But the general character of the work may be foretold by those who were familiar with his riper thoughts. It is safe to assert that his "Social Geography" will, more fully than ever before, demonstrate the continuity and correlation between, on the one hand, the destructive action of man on the surface of the planet, and on the other, the historical and the contemporary facts of human degeneration and civic degradation. But it will also, unless the work belies the character of its author, demonstrate also with unique experience and conviction a continuity of



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ascent from geographical science to the loftiest aspirations of social idealism.

### XV

The geographer's vision of the city, as the realisation of regional potency, is a faculty not of the professed scientists only. It is possessed also in varying degrees of fulness and clearness by every wise and active citizen, or at least by every citizen not altogether dehumanised by the machinery of education and affairs, or as Mr. Wells says, "birched into scholarship and sterility." It was the geographer's vision that prompted the city fathers of Glasgow to transform the shallow estuary of the Clyde into one of the great highways of world commerce. It was the absence of the geographer's vision that prompted Philip II. of Spain to cut off the national capital from access to the sea by removing it to the arid central plateau. It has been the geographer's vision which has inspired so many German municipalities to purchase and allocate to the common weal large tracts of suburban territory. And wanting the geographer's vision, our own municipalities have too often allowed the immediate environs of our cities to become the prey of the jerry builder and the land speculator. These are obvious and conspicuous examples. But the influence of geographical foresight, or its absence, is to be traced into every ramification of civic policy, into every department of civic activity. To draw upon the resources of

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geographical science for the construction and criticism of civic policy is a manifest obligation, or, as it ought to be, a privilege and pleasure of the city fathers who are immediately responsible for civic policy, and of the body of citizens who are mediately responsible for the same. But are there not also whole bodies of the citizens into whose occupation and livelihood the application of geographical knowledge so largely enters that they might almost be called applied geographers? Is this not true of all those classes engaged in the organisation of facilities for travel and communication from the railway manager to the station porter, from the pilot to the bargeman, from the hotel-keeper to the cabman, from the road-surveyor to the crossing-sweeper? And in less degree is it not true likewise of the whole trading class, whose business consists in shifting goods from the place of growth and production to their destination in the hands of consumers? For all these, from the city father to the crossing-sweeper, the question is—Does each one utilise, to the fullest, such resources as contemporary geographical science can and should supply? The President of the Royal Geographical Society is the servant of the crossing-sweeper who has the knowledge and the imagination to use him.

### XVI

What are the resources of geographical science?  
Where are they to be found? How may the

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inquiring citizen utilise them? How may the crossing-sweeper utilise the President of the Royal Geographical Society? If the inquiring citizen was fortunate enough in his youth to commence a career of travel and exploration, by frequent truancy from school, then, doubtless, he acquired habits of observation which later on became disciplined into a scientific temperament. Doubtless in that happy case he is thoroughly familiar with the resources of geography. But most of us grew up into respectable citizens uninspired by that fear of the school-master which is the beginning of science. And if we have our scientific education still in front of us, we cannot do better than begin it by buying a copy of the admirable annual called the *Science Year-book*, issued by Messrs. King, Sell and Olding, of Chancery Lane.

Of the seven or eight sections in which the contents of this publication are divided, there is one called "Scientific and Technical Institutions." A first glance at the contents of this section might lead one to suppose that the book is of a humorous and satirical kind, for its list of scientific and technical institutions begins with an enumeration of "Government Offices." Saving this lapse, the book is to be taken as a serious manual. It enumerates and briefly indicates the functions of ninety-nine organisations in Great Britain called "Scientific and Learned Societies." These include small new groups such as the thirty oceanographers who constitute the Challenger Society, and meet once a quarter in the rooms of the Royal Society

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in London, and periodically issue a series of oceanographic charts. Amongst the purely scientific societies, that which attains to the largest membership is the Royal Geographical, with its 4180 members. The functional activities of the Geographical Society are described as follows in the *Science Year-book* :—

I. MEETINGS.—Weekly, November–June, evening. Anniversary, 4th Monday in May.

II. PUBLICATIONS.—The *Geographical Journal*; monthly. *Year-book* and *Record*; and various special publications.

III. MISCELLANEOUS.—Medals: Two Royal Gold Medals, the Founder's and the Patron's, awarded annually; and the Victoria Medal at intervals. Money grants are also made from trust funds. A fine library of upwards of 37,000 books and pamphlets is maintained, and a map-room. The latter receives a Government grant of £500 per annum, on condition that the public shall have access to the collection.

Now the monthly *Geographical Journal*, the chief organ of the society, is an invaluable publication, but the only person who, in all probability, reads it through is its own editor, and that is as it should be. Life is too short to read the *Journal* of the Geographical or any other scientific society. But what every one should do is to utilise the spiritual organisation whose visible organs are the whole series of scientific periodicals. To do this we must know how to consult the files of these periodicals; in other words, how to put and answer questions through their pages. All these learned periodicals would be more popular were the common and obvious fact known to editors and proprietors of newspapers—as conceivably some day it may be—



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that the most abstruse and recondite of scientific journals is nothing but a variety of the familiar publication known as *Notes and Queries* in its higher form, and in its lower forms, *Tit-Bits* and *Answers*. It would indeed introduce an agreeable and useful uniformity in periodical nomenclature if there could be one generic name with adjectival differentiations, such, for instance, as the *Zeitschrift für Socialwissenschaft* calling itself *Social Notes and Queries*, and the *Archiv für Rassen und Gesellschafts biologie* calling itself *Race Notes and Queries*, and so forth. That the analogy between the popular and scientific variety is real and not fanciful will further be recognised when it is observed that what are called conundrums and solutions in the one, are called memoirs and hypotheses in the other. And moreover the successful contributors are, it will be seen by reference to the above description of the Royal Geographical Society, rewarded, if not by participation in a guinea prize, yet by one or other of "the two Royal Gold Medals which are awarded annually," and "the Victoria Medals which are awarded at intervals."

### XVII

The *Journal* of the Royal Geographical Society consists of two parts. There is in each month's *Journal* a bundle of maps and a budget of letterpress. In order to utilise the resources of the society, which functions through its *Journal* and

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other publications, one must learn the interpretation of the symbolism and notation of the maps, and one must acquire familiarity with the few technical formulæ which occasionally break through the ordinary and simple language of its letterpress. There are simple, easy, and pleasant ways of achieving both these ends—in fact, short-cuts by which one may penetrate right into the heart of geographical science. To master the symbolism and notation of cartography, all one has to do is to compare the best contour maps (that is to say, those of the Ordnance Survey) with what one sees with naked eye, with field-glass, or with telescope, when one ascends the high points of vantage in one's own region. These high points of vantage are, of course, for the towns and cities, their towers, such as they may be; and for the surrounding country, whatever mound, hill-top, or mountain summit one's excursions and explorations may discover. The primary problem of the cartographer is to show by symbolic notation on a flat surface all the varying heights and shapes assumed by, or imposed upon, the earth's surface, above or below sea-level. What the ideal geographer, as cartographer, first of all tries to do is to devise a notation by which he and his fellow-geographers, by the inspection of a map of a given region, may get a simultaneous vision of the terrestrial phenomena which all the explorers and observers of that region have collectively seen. Now it must always be that however minutely observed and explored a region—even the most

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inhabited—may be, there is always something new to be observed, even in the shape and configuration of the surface, for these are always changing ; while the things and events, natural and human, which are continuously happening (for these also have to be mapped down), open up an endless vista for the future development of cartographic science. Hence there is no more easy and natural individual progress than for the school-boy beginner to pass onwards from simple observation of recorded phenomena to discovery of new ones. Once begin in the right way and acquire—which is so easily done—the right habits, and then the position of discoverer, will be reached by a normal and natural, an insensible and inevitable growth. As elsewhere, it is the first step which costs, and here it costs two shillings—that being the price of a “Bartholomew” pocket tourist map for your own region. It will be on a scale of 2 miles to the inch, if you are fortunate enough to be a Scotsman, and 4 miles to the inch if you happen to have the disadvantage of living in England. These maps you carry with you on your walks, your bicycle rides, your river excursions ; and when you get back to the town or city of your region, you go to the Public Library where the largest ordnance maps are kept, and you observe how the things you have seen are noted or are not noted on these ordnance maps. And if they are not noted, there and then you begin your apprenticeship in scientific research in seeking out other maps which record different

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varieties of regional phenomena ; for example, the kind, the quantity, and distribution of its fauna and flora, its rainfall and its sunshine, the statistics of its population, its routes and communications, and so forth indefinitely. The problems which the young geographer finds in front of him grow rapidly in number and complexity, but his interest in facing, in investigating, and in solving them will be found to grow still faster. The explorations in the open air, alternating with research in library and study and map-room, will very soon whet an insatiable appetite for an understanding of the ever-changing phenomena of his region. The pleasures of observation, which, unlike other sensual pleasures, do not pall with usage, are themselves succeeded by the still keener pleasure and intenser joy of generalisation and interpretation. In brief, the outlook on the visible phenomena of one's region itself evokes and inspires a craving for insight into the larger world into which our own region extends on all sides by insensible gradation, and to which it is felt to be linked by innumerable bonds. It is just here, where the margin of his own region melts into that of the surrounding world, that the student requires and may readily utilise, the full resources of the whole science of geography. His previous reading will have been of the best geological and geographical accounts of his own region, and the comparison of these with what he has seen with his own eyes. This preliminary study will have insensibly familiarised him with the technical phrases and formulæ which

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are necessary for getting into touch with his brother geographers elsewhere throughout the world, and utilising the observations, the thought, the interpretation of these, as well as the accumulated writings of their forerunners in the concerted effort of the whole past and present race of geographers, to visualise and to understand what passes on the surface of the globe.

### XVIII

To realise the magnitude of what might be called the geographical group in Britain, we must add to the 4170 members of the society located in London the members of various local societies, such as those in Manchester and Liverpool, and also the considerable number of unattached mapmakers and geographical observers and writers. And, again, to these have to be added the corresponding group in Scotland, of which the Royal Scottish Geographical Society is the nucleus, with its 1100 members, its monthly journal and other publications, issued from its headquarters in Edinburgh, there being associated societies in Glasgow, Aberdeen, and Dundee. And, furthermore, every capital in Europe and many of the larger of the provincial towns contain similar groups of professed geographers with similar organisations, journals, and other publications. The New World also has its geographical societies, and with the formation of one in Japan they are penetrating the Orient. Here, then, is no national or even international, but a

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world phenomenon, a universal brotherhood. It is a real fraternity in which the individual members and the several groups are linked together by a highly-organised system of inter-communications, by common aims and purposes, by a common method of thought and observation, by a common symbolism and system of formulæ, by common beliefs about the world and men's place therein. To imagine the resources of geographical science we must think not only of its accumulated documents, instruments, and aptitudes, but also in a still higher degree of the spiritual forces that pervade and animate this universal organisation, this world-extensive community of similar minds. And any one who is learned enough to master the symbolism of geography, to consult the files of the periodical publications is, if not a full brother, yet a novitiate of this universal fraternity. And to be a member of this community, what does it mean? It means much or little in proportion to the impulse and knowledge to utilise the collective resources of the community.

### XIX

It is the boast—and a real and justifiable boast—of the Catholic Church that its Pope is a servant of every member of the Church down to the most insignificant, that he is in name and fact *servus servorum*. Now in the scientific community there is no pope, but there are many high priests. The scientific community is a democratic organisation, not a hierarchic one. Its high priests are just

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those members of the community who have themselves done most to forward the progress of their science. Every high priest of geography, as of every science, is, in quite a literal sense, a slave of every investigator who is working in that particular field, or a related one. The organisation of research and the system of inter-communication are so arranged that the tasks beyond the strength and the problems beyond the power of the ordinary members of the community are continually being collected and automatically delivered at the workshop of this or that high priest. His workshop is usually a small room with a few books and maps. Here, without fee or charge, he completes the unfinished tasks and solves the harder problems. And hence he delivers the finished goods as a free gift to the community at large. He is fortunate indeed if he escapes without having himself to pay the cost of delivery. The reward of his office is harder work, less pay, and more criticism than that of the ordinary brothers. The high priest of geography, as of other sciences, is not differentiated by sartorial insignia, by definitive status, or by obsequious designation, but is generally recognisable by certain personal characteristics — by the world light that shines from his eyes, by the nobility of his countenance, by his threadbare coat, and usually, it must be confessed, by the baldness of his head. In the common phrase of every-day life he is known as an "eminent scientist"; in the jargon of his profession he is an "authority."

It is the real though unexpressed ambition of

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every young scientist to become an "authority." In the many graduated stages towards this consummation there is one of special significance. If the young observer steadily continues his observations and interpretations, and faithfully compares his results with the records of science, he will find that he steadily progresses towards a climax. He will some day catch a moment or a mood, a phrase or a happening, in the fleeting movement of things, which will thrill him with an emotion intenser than any he has before experienced. He will instinctively feel that one of the secrets of the universe has been revealed to him and to him alone. Under the mysterious glow of an unforgettable enthusiasm he will feel his personality expand, until the self of his ego meets and touches in a sublime union the self of the world. In other words, he has been initiated into the fraternity of science, and for the first time he is, and feels himself to be, no longer a mere novice, but a full brother of the community.

It is clear we are here in the presence of a psychological phenomenon known in another walk of life as Conversion. In science it is known as the discovery of new truth. It may be a truth which is of the most trifling importance in relation to the total body of ordered knowledge which we call science. But the event is, in the life history of the individual scientist, one of most profound significance. It is, if not a turning-point in his career, yet an experience which will not be without its effect upon his whole future life. As is the way



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of the older spiritual communities the event here, too, is celebrated by a particular ceremony of initiation. The scientific ritual of initiation has two well-marked stages. The first consists in the contribution of a memoir to the proceedings of the relevant society. The second consists of a copious baptism, in the form of a cold-water douche of criticism, from his brother scientists.

### XX

If the foregoing analysis has suggested a fanciful analogy between religious and scientific experience, it has entirely failed in its purpose. The intention has been not to suggest an analogy, but to indicate an essential similarity, indeed, a partial identity of type. In the language not of psychology, but of sociology, the contention is that the scientific and religious groups are vitally related in their social origins and functions. Addressing an audience of biologists one would probably convey the intended impression by saying that science and religion are social organs which are in part both homologous and analogous. But the rightly discredited usage of biological terminology in social science prohibits recourse to that language. The argument is that science has its social as well as its logical and psychological aspects, and that from the former point of view a scientific society is manifestly to be classed amongst the social institutions. And that, moreover, in the wide and varied range of social institutions the place of a scientific society is, it is affirmed, alongside of the church. The

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characteristics possessed in common by the religious and scientific community can be traced out in detail. If, for instance, the scientist resorts to a public library to read the journal of his favourite society, he is obviously paralleling the tendency of the laxer churchman to escape the monthly collection for what in certain nonconformist churches is called the sustentation fund. But minute detail and formal aspect apart, what is it that constitutes the essential similarity of type in the religious and scientific group ?

The immense multiplication of religious sects in the present day, and in history, is popularly accounted one of the least creditable features of civilisation. The sceptics deprecate it as a bad habit, like alcoholism and immorality, into which the uncultivated man is prone to fall. But in itself, and apart from its secondary effects, the mere proliferation of sectionally religious bodies is simply an expression of spiritual freedom. In joining this, that, or the other church, in remaining within its fold, or in leaving it, the individual believes himself to be actuated by non-material motives. He believes that he is uninfluenced alike by the parliaments that make laws, the bureaucracies that administer them, and the judges that interpret or misinterpret them. He believes that his religious life is unconditioned by the policeman visible at the street corner, by the sovereign invisible on his throne, and the soldiers that display his royal uniform. In brief, the member of a religious community believes himself to have risen into a world

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of spiritual freedom, untrammelled by the prohibition and compulsion which in civil history are called law and politics; in natural history, tooth and claw. How far this belief in a life of spiritual freedom is real, and how far it is illusory, matters not for the moment. The point of insistence is that the members of a religious community are bound together by similarity of ideas and feelings, and not by bonds which rest upon a potential recourse to physical force. In other words, the social influences immediately operative upon and amongst a religious community are mental, moral, and æsthetic. They are not legal and political. And in this respect at least it is sufficiently manifest that the scientific community resembles a religious one.

### XXI

It is one of the merits of Comte to have aided the progress of thought by generalising under the one conception of Spiritual Powers all those agencies and institutions which influence men by mental, moral, and æsthetic considerations. His corresponding conception of Temporal Powers generalises agencies and institutions which operate on or influence conduct by an actual or potential recourse to physical force. The Spiritual Powers thus seek to substantiate or to modify belief—using that term in its broadest sense—having as their instruments ideas and emotions. Temporal Powers seek to determine conduct by using material rewards as impulse, and physical fear as deterrents,

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The popular distinction between State and Church may be regarded as a particular case of the wider popular distinction between the Law and the Gospel; and this again is a particular case of the larger scientific generalisation of Temporal and Spiritual Powers. There are, of course, practical advantages which prompt the popular mind to extend its widening circles of general concepts, which again are further refined and developed by science. The general concept is to a mere collection of facts what regimentation is to a mob of men. It enables one to neglect individual eccentricities and predict the collective behaviour of the group, whether the group consists of items called facts or items called men. The inducement to widen the generalisation is, that the larger its scope the broader are the limits of prediction. The assumption made is that the process of generalisation is a gradual one, and that the steps from the concrete facts up to the largest generalisation are all traceable without a break. In other words, a generalisation must be of a kind which in science is called verifiable—that is to say, the prediction based upon it must refer to a course of future events, which must either happen or not happen at a given place and within a given and finite time. And this proviso of verifiability gives a definiteness and fixity to scientific generalisations, which is often absent from those alike of the popular mind or of the poetic imagination.

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### XXII

There are those who tell us, that there is no proper science of society because there are no known sociological laws. Others go still further, and say that the nature of human society is such that no social laws are discoverable, that there is no science of human society, that sociology not only does not, but never will exist. This is a mode of argument well known to historians of scientific thought. It has been used at every epochal advance by the obscurantists to justify their ignorance and soothe their vanity. It belongs, in fact, to the self-protective devices so common everywhere throughout the organic world, and especially amongst the higher animals. Probably the most effective reply to this sort of criticism is for the scientific observer to ignore it, and to continue without interruption his observations and generalisations of them. If those who tell us there are no laws in social science would say instead that they themselves do not know any such laws, we might be happy to agree with them. And if those who say there never can be any such laws would say instead that they themselves are determined never to know any such laws, we might reasonably leave them in possession of the ignorance to which they have pinned their faith, with such a noble assurance that it will last their time.

In point of fact, what generalisations, in the nature of scientific law, are there at the disposal of the sociologist who wishes to predict the future

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of an incipient Spiritual Power? A full stock-taking of resources would here disclose a considerable number of working formulæ, which resume a vast mass of experience as to the origin, growth, and decay of various forms of spiritual power.

But for the present purpose the following generalisations especially serve, viz. :—

I. That Spiritual Powers in the course of their historical development gradually conceive and formulate a Social Ideal, and this Social Ideal tends to be in conflict with the existing Temporal Power.

II. That each Spiritual Power tends to develop two types of organised community—a type predominantly passive and contemplative, and a type predominantly active and militant.

III. That the active type of Spiritual community endeavours to generate a congruent form of Temporal Power as the material embodiment and mundane expression of its particular Social Ideal.

IV. That in this endeavour various institutions are developed, which help to determine each era of city development, both in respect of buildings and of civic policy.

### XXIII

The conflict and interaction between temporal and spiritual ideals in the history of Western Europe during the Christian period is, of course, one of the commonplaces of social discussion. But the detailed influences and reactions, especially on city development, of the respective ideals

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of the Law and the Gospel have not been sufficiently worked out. The system of feudal law, which still encrusts occidental civilisation, has its animating principle in the mediæval maxim, *nulle terre sans seigneur*, which might be conveniently translated as, in the social sense, *No spot without its despot*; and in the civil sense, *No foot of soil without its functionary*. The contrast of these ideals with that of Christian ethics—the kingdom of God is within you—is sufficiently obvious. But what the student of city development has to do, is to decipher and work out the expression and interaction of these conflicting ideals in each successive phase of civic architecture and civic policy. Thus, for instance, in the case of London the sociologist is to see how the Tower and Windsor Castle are the expression and embodiment of certain political ideals, and he is to trace throughout the history of London the influences and ramifications of the Tower and the Castle, and follow their line of direct descent down to the existing institutions which are their functional analogue—these presumably being the contemporary Functionary-factories of Whitehall. In the same way, he is to see how Westminster Abbey and St. Paul's are the culminating expression and embodiment of certain spiritual ideals; and their influence and reaction on civic life and architecture is likewise to be traced through successive stages of city development, and the analogous types of institutions to-day have to be discovered and described alike in their structural

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and functional aspects. And every city has for the sociologist its corresponding problems of factual observation, of historical analysis, and of scientific interpretation. All these again, to be sure, assume their place as specialist researches within the larger problems of general sociology.'

Now, if we apply the four-fold sociological formulæ above indicated to the present and future phases of science, considered as a spiritual power, what inferences may we legitimately draw? The existing groups of science, whether or not organised in definite societies, are comparable, we have seen, to the various sects of the religious community. Now these numerous and varying sects, like their more archaic religious types, have their rivalries, jealousies, feuds and bickerings. The mathematicians, for instance, are apt to form an exclusive caste apart, holding no converse with groups which know not their particular shibboleths. Again, the spectacle might have been seen, at a recent meeting of the British Association, of rival biological factions warmly anathematising each other. A momentous and historic instance of scientific sectionalism is seen in a work now in progress, which is probably the largest co-operative enterprise yet undertaken by modern scientists. A few years ago the Royal Society convened in London a great gathering—a sort of Council of Trent—of scientific fathers, representing all the leading academies and societies of Europe and America. The purpose of this great gathering was to decide upon an authorised canon of the



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sacred texts. A momentous decision was reached. It was concluded that a sufficient degree of traditional sanctity did not attach to the writings of the economists, the psychologists, the sociologists, and some other orders. The writings of these were accordingly omitted from that authorised canon, which is now in course of actual compilation under the title of "The International Catalogue of Scientific Papers." It is clear from these evidences of internal disruptiveness, that science as a whole does not at the present moment possess that cohesiveness and unity of aim which are vital to a period of demiurgic spiritual effort.

### XXIV

On the evidence of internal disintegration one would infer that science has either passed, or has not yet reached, its constructive synthetic era. But are there not signs around us which point to a coming and even incipient period, in which science will develop its doctrine of human life as a great spiritual power? The clearest notes in this scientific chord which is beginning to sound are perhaps the geographical and the biological ones.

We have seen how the geographer, no longer merely interpreting the present by the aid of the past, is beginning to have visions of the future. In seeing the city as the realisation of regional potencies, he cannot but feel also an ideal impulse towards organising the city as an optimum adaptation of the regional environment to human life.

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The geographer's social ideal is indeed in process of explicit formulation, and that on many sides. And in its application to a particular city, the most notable perhaps of these formulations may be found in one of the books indicated for reading in connection with this paper. It is Professor Geddes' "City Development." Here indeed the ideal of city development is by no means confined to that of the geographer, but the civic policy here enunciated has its definite starting-point in the geographer's vision of the city. And other similar initiatives are visible in many different directions. The Garden City movement is essentially geographical in its point of departure from traditional civic policies. And the same may be said of Mr. H. G. Wells' Utopist writings (in which the biological note is also sounded); and indeed of all those who advocate a certain ruralisation of the city, whether by the development of parks and gardens, or by other means. However much all these differ from one another in other points, they agree in their emphasis and insistence on a better regional adaptation to city life. It is clear in fact that we are here in the presence of a movement towards an Applied Geography. The division of science into pure and applied is a familiar one up to a certain point, but we may more readily apprehend its significance, if we view it as comparable to the distinction between the Regular and the Secular orders in religious communities. Like the Regular orders, the cultivators of pure science concern themselves mainly with doctrine, while the applied scientists,

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like the Secular orders, have their main interest in the application of doctrine to the needs of daily life.

### XXV

Amongst existing groups of scientists which are the Seculars, which the Regulars? In the Physical Sciences it is easy to recognise actual or incipient Regular orders, in mathematicians, in students of heat, light, electricity, chemistry, &c. On the practical side there is the great body of engineers, with its numerous subdivisions, there are manufacturing chemists, the brewers, the opticians, &c.—are these the Secular orders in the physical group? Before answering that question we must discriminate. The differences of type are very great. It is, for instance, a far cry from the stoker, or even the driver, of a coal engine at the one end of the scale, to, at the other, the active partner in the firm of Messrs. White & Co., electricians and instrument makers; for the active partner in that firm is, or was, Lord Kelvin. It will be urged that Lord Kelvin as instrument maker and electrical engineer is merged and sunk in Lord Kelvin the professor, the investigator, the theorist. But the opposite interpretation would be equally true and equally false. The essential point is to see that it is the very coincidence and alternation of theory and practice, of science and art, of thought and action, that above all, differentiate and mark off the Seculars of science from those of other varieties of Spiritual Power. And applying this distinction, we readily

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recognise that the great majority of engineering occupations do not really belong to science at all in the proper sense, but are persistent survivals of a pre-scientific age. The empirical rule-of-thumb types of engineer are still predominant, but they essentially belong to a pre-scientific order that has been well called Palæotechnic. They do not possess the physicist's vision of the world, still less therefore do they seek to apply it to life. The physical scientist in his cosmic mood sees the world as an automatic system of energies, with a tendency to run down and without a discoverable means of winding it up again; while as to the why and wherefore of its being originally set going, the data of his science give him no clue. Looking at the same phenomena in his humanist mood, he sees the flux and transformation of forces take on and assume a definite design and purpose, which the very logic of his science compels him to postulate as an inherent potency in the very system of energies. He sees every form of energy a potential slave of man. He sees the cities scattered over the face of the globe, as the supreme, the collective, the ceaseless effort of the race to realise this potency of energy, to harness it in the service of man. The type of physical scientist in whom the cosmic mood is habitual and dominant is the actual or incipient Regular. But where the grand and inspiring ideal of realising for man the potency of world energies animates the physical scientist, there clearly we have the possibility of great Secular orders. And that such orders are everywhere incipient and

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rapidly developing, there are many evidences to show. These evidences are vividly depicted in the sociological writings of Mr. H. G. Wells, who more than any one else perhaps in the English-speaking world has seen, or at least expressed for us in literature, the incipient changes in city development which are being effected by these new Secular orders of applied physical science.

The new type of engineer is tending more and more to assume control of the communications of our cities, their factories and workshops, the great public works of water supply, lighting, drainage, &c. And thus gradually determining for us the material conditions of life, the new engineer acquires social status and prestige. And in pursuance of the well-known sociological law, that those who have social power tend also to get civil and political power, we are bound to assume that the engineer types, as they are already tending to control civic policy, will sooner or later seek to control national and even world policy. And that these higher aspirations are already well on the way towards achievement is seen in the influence now being exercised by the railway kings of America, not only in their own country but also in world politics. With the advantages brought about by the activities of these new Secular orders, there are of course corresponding disadvantages. The conception of a city held by the railway engineer is, we have already seen, not that of a city at all, but that of a town. And this limitation applies throughout the whole sphere of thought and action belonging to this

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phase of life. It manifests itself even in Mr. Wells' Utopist pictures of the cities of the future. For in these idealist cities, is it not the case that the inhabitants, notwithstanding their manifold cultural activities, have still their main interests in the material aspects and conditions of things. Are they not, in fact, townsmen first and only citizens thereafter?

### XXVI

If the foregoing criticism is a just one, the cause of the limitation is doubtless to be sought in some arrestment of normal scientific development. The physical scientist who remains such falls a long way short of repeating and resuming the normal racial development. For above and beyond the physical group of sciences, the race has conquered or is conquering for science higher domains. Immediately above the physical sciences is the biological group. Here, who are the Regulars and who the Seculars? It is not difficult to see the regular type in anatomist and taxonomist, in physiologist and œcologist, in embryologist and palæontologist, in ontogenist and phylogenist. These, or some of them, are doubtless strange names, unfamiliar to the public, even to that small section of the public which enjoys a classical culture. But the groups of scientists thus characterised nevertheless exist, and that moreover in growing numbers and influence, all over the western world. They are organised into bodies

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which are essentially Regular orders of an incipient Spiritual Power, and as such they are silently preparing a great moral revolution. Where are we to look for the Secular orders who will be their active instruments of temporal change? The occupations concerned with the biological or organic side of civilisation are, of course, those of peasant and farmer, of gardener and stock-raiser, along with medical doctors and surgeons, not to mention the herbalists and the nurses, the barbers and the hairdressers, the gymnasts and all the lower and older groups of occupations, from and through which the medical profession has risen to its present summit. Which amongst all these are the Secular orders of science, and which the empirical survivals of a pre-scientific age? To answer that, we must first ask what is the special vision of the world which animates the biologist? and further, we must ask what militant groups are there whom this vision stimulates into practical activity? The biologist, like other scientists, has his cosmic and his humanist mood. In the former he sees an endless chain of developing life beginning he knows not how or why, and tending he knows not whither. In his humanist mood he sees the same unbroken chain that links together the whole series of organic beings; but now sees in it evidence at every point, from lowest to highest, of the promise and the potency of a supreme culmination. And in the most beautiful and noblest of human beings he sees a form which, by taking thought, the whole race may reach and surpass.

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To the biologist the city is thus no mass of mere inorganic structures, but a group of organic beings which individually pass away but racially abides, continues and develops towards a definite ideal or degenerates to its opposite. And the ideal of the city is therefore to the biologist the full realisation of racial potency. Who amongst biologists are stimulated into activity by this vision of civic potency? Increasingly large numbers of the medical profession are animated by the ambition of preventing rather than curing diseases. The noblest instances of missionary enterprise are paralleled by the self-sacrificing adventures and exploits which daily engage the lives of the enthusiasts of the newer medicine. The missions that go out from the Pasteur Institute in Paris to study (say) typhoid fever in Brazil, or from the Institute of Tropical Medicine in Liverpool to investigate (say) yellow fever in New Orleans, are merely conspicuous instances of a heroic activity that is normal in that increasing wing of the medical profession beginning to be called the hygienists. Of these many are already organised into large and well-established Secular orders, such as the various institutes of public health, sanitation, &c., to be found in every large city. Others, less directly but still more vitally, are beginning to influence both civic and national policy through great institutions of the more regular type of order, such as the Pasteur Institute, and similar organisations incipient elsewhere.



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## XXVII

A new Secular order of biologists is beginning to appear in the Eugenists, who seek to develop and apply Mr. Francis Galton's doctrine of Eugenics. It belongs to this doctrine to rescue the "perfect man" from the lumber of archaic survivals, and restore it, not as an idol of a Golden Past, but as a legitimate ideal of the future. Taken over from theology by political philosophers of the eighteenth century, the idea of the Fall of Man from a state of primordial perfection became a powerful solvent of economic and political institutions. An abortive and premature attempt was then made by early biologists and sociologists to use the doctrine as a constructive ideal by transforming it into the conception of a future perfectibility of type. But in the generation which witnessed the classic demonstration of organic evolution by Spencer and Darwin, by Haeckel, Wallace, and Galton, the very idea of perfectibility was discredited. Nevertheless the language of the Fall persisted, and of necessity had its unconscious influence on thought. It was therefore quite natural, if not inevitable, that the place of Man in the animal series should be worked out in terms of descent and not ascent. But the idea of potency latent in organic evolution was bound to manifest itself.

It was Francis Galton who first and most fully made the change from the cosmic and naturalist to the humanist and idealist mood in organic evolution. His doctrine of Eugenics shifts the

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centre of interest in Man's pedigree from the Past to the Future. Actually and in point of fact the worst bred of animals, Man has become so, because he of all animals has the highest potency for degeneration or for evolution. That is one of the truths revealed to us by evolutionary biology. The other is the legitimacy of aspiration towards a future ideal. But the ideal of evolutionary biology markedly differs from its pre-scientific anticipations. It is an ideal definable as starting from a known potency, and approximately realisable within finite space and time, and to be reached by ascertainable processes operating within discoverable limits. In short, the ideal of Eugenics has the scientific character of being a verifiable ideal and not an illusory one. It postulates an ideal type towards which we can definitely steer and certainly move with assured hope of approximately, but never actually, reaching it. For the ideal itself undergoes evolution, the very increase of evolutionary potencies and processes being itself the warrant of higher aspirations. Mathematicians express the relation of two paths always converging but never meeting by the word asymptotic. Originating outside the systems of professed philosophers, evolutionary idealism has yet its necessary relations to traditional doctrines of idealism and realism. Its place and correlation with these has yet to be worked out and defined. But meantime it may help towards establishing a point of contact with existing systems of philosophy to say that evolutionary ideals express an asymptotic reality.

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## XXVIII

The favourite recourse of the ill-informed members of a community to escape the penalties of nescience, is to normalise their own defects and to postulate a universal ignorance. This protective device of the cunning animal is nowhere more frequent than in discussions of the problem of heredity. It is frequently asserted that we know nothing at all of heredity with precision and certainty. It is quite true the biologists and psychologists have a great deal still to learn about heredity. But it is equally true that they have a great deal to teach. And the citizen as well as the student can only escape the charge of hopeless obscurantism by promptly putting himself to this school. One of the first things he will learn is the deep significance and the practical importance of the distinction between organic inheritance and social inheritance. The former is concerned with the heritage that comes to us in organic descent from our family stock, *i.e.* the pre-natal influences which condition our life. The latter is concerned with the qualities and aptitudes that come to us through training and education, through tradition and experience—in a word, through the post-natal and therefore social influences that condition our life. Small or great as may be the ordered and verified knowledge accumulated by the students of organic inheritance, there can be no question of the mere massiveness and quantity of our knowledge of

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social inheritance and social variation—in a word, of social evolution. Where is all the knowledge to be found? Who are its guardians and continuators? Are they not called historians and economists, political philosophers and comparative jurists, anthropologists and folk-lorists, psychologists and æstheticists, students of ethics and of comparative religion? Are not all the foregoing of the nature of Regular orders engaged in studying the various aspects of our social heritage of industry and commerce, of law and morals, of religion and art, of language and literature, of science and philosophy? If they are not, who and where are the Regulars of Social Science? who and where the Seculars? Occupied on the practical side of our social life are the merchants and the manufacturers, the politicians and the lawyers, the journalists and orators, the artists and literary men, the teachers and professors, the moralists and priests. Which amongst all these are the Seculars of Social Science? which the persistent survivals of the pre-scientific ages?

### XXIX

To answer these questions we must ask what vision is seen by psychologist and sociologist in their cosmic or naturalist mood, and what in their humanist mood? What potencies do they see in social evolution, in city development? What groups (if any) of more militant type are inspired by these visions of social potency, to

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work towards the realisation of the corresponding ideals? In reply, little can be said at the close of an already prolonged paper. The sociologist in his naturalist mood sees the city as successive strata of wreckage and survivals of past phases in the endlessly-changing antics of a building and hibernating mammalian species. In his humanist mood he sees—somewhat dimly, it must be confessed—the city as the culminating and continuous effort of the race to determine the mastery of its fate, to achieve a spiritual theatre for the free play of the highest racial ideals. In short, the cities of the world are in this view but processes of realising the spiritual potency of the human race. They are the true homes of Humanity. And it is just here that science—whose mission it is to fulfil, and not to destroy—reveals to us the germ of truth in the popular sentiment, which insists that the essential characteristic of the city resides in the University and the Cathedral. The truth, to be sure, is that it is the presence of functional institutions of the highest spiritual type, whether or not we call them University and Cathedral, that differentiates the city from the town. It follows that the civic policy of our Secular sociologists—if we have any—must be concerned with the city as itself a cultural potency, and with the whole body of citizens as individuals responsive to the creative influences of the spiritual ideals, active or latent, in drama and poetry, in art and music, in history and science, in philosophy and religion. The most comprehensive,

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abstract, and general statement of culture policy from the sociological standpoint still probably remains that made more than half a century ago by Comte in the "Positive Polity," which was really the Utopia of his later thought, educated and matured by the preliminary preparation of the "Positive Philosophy." Fortunately, the four massive volumes of his "Positive Polity" were condensed and summarised by Comte himself, and the contentious elements for the most part omitted, in the single small and cheap volume translated by Dr. Bridges as a "General View of Positivism." Ranking with Comte's statement of culture policy in its comprehensiveness of outlook and far-sighted vision, but written from the standpoint of contemporary science, and therefore appropriately detailed and concrete in reference, here and now, in plan and section and perspective, to a particular city, is Professor Geddes' recent book, "City Development," already cited for its geographical vision, and now for its sociological ideals. These two books, from their different but correlated standpoints, express a doctrine whose isolated elements are everywhere recognisable. It is evident, therefore, that the life out of which the doctrine is fermenting is in active growth. If, then, they are not already here, we may be sure that the Sociological Friars are coming.

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## *List of Books for Reading and Reference.*

### I.

1. "Life and Labour of People in London." Charles Booth. (Macmillan.)
2. "Poverty." Seebohm Rowntree. (Macmillan.)
3. "Housing Conditions of Manchester and Salford." T. R. Marr. (Manchester.)
4. "The Example of Germany." T. C. Horsfall. (Manchester University Press.)

### II.

1. "Anticipation." H. G. Wells.
2. "Mankind in the Making." H. G. Wells.
3. "A Modern Utopia." H. G. Wells.
4. "To-morrow: A Scheme of Garden Cities." Ebenezer Howard.
5. "City Development." Patrick Geddes. (Edinburgh, and St. George Press, Bournville.)

### III.

1. "General View of Positivism." A. Comte. Translated by Dr. Bridges. (Reeves & Turner.)

### IV. PERIODICALS.

1. *La Science Sociale*. Edited by E. Demolins.
2. Sociological Papers, published annually by Macmillan for the Sociological Society, 5 Old Queen Street, Westminster, S.W. (*Vide* especially vols. i. and ii., articles on "Eugenics" by Mr. Francis Galton, and on "Civics" by Professor Geddes.)

